

MEP (Mechanical, Electrical, Plumbing): Mentoring - Guide for the Electrical Field:

Mentoring junior & mid-career Electrical Engineer(s) within the MEP field is crucial for their professional growth. Success in electrical engineering requires extensive hands-on experience, steady skill development, and a clear career pathway from EIT toward Professional Engineer (P.E.) licensure.

Here is a **10-point roadmap** designed to help mentors guide junior and mid-career electrical engineers toward greater technical proficiency, professional confidence, and leadership readiness within the MEP industry:

1. Start with the Big MEP Picture

- Explain the entire MEP team effort, the design cycle and how electrical fits into the entire building system; through collaboration and integration with architectural, structural, HVAC, plumbing, fire protection, and furnishings, as well as with designers, utilities, code officials, and contractors.
- Give them MEP context: Why does their work matter? Help them understand how and why their designs are used during development, bids, permitting, construction and commissioning.
- Start with explaining a typical MEP project's design lifecycle: development stage, RFQ, building the Team, schematic design, 30-60-90 (progressive) design development phases; and finally, 100% IFC (Issue for Construction).
- Review a variety of past projects, industrial, high-rise, commercial, educational, medical ... etc. Demonstrate some past projects of varying scope, delivery and complexity. MEP design is a professional service, not a commodity, and requires tailored solutions.
- Get them started using checklists, KPI's and collaborative work techniques. Show them the tools necessary to stay organized.
- Introduce them to Utility guidelines, UL508A shops, Electrical Vendor & Supply companies' products and specialty Low-Voltage Electrical Contractors services.
- Showcase your firm's annual and 5-year business & marketing plans. Transparency and open books help to build informed & effective team members and foster highly productive business-wise professionals.

2. Introduce Key Codes and Industry Standards

- Master the NFPA 70 NEC (National Electrical Code), include a handbook version copy on their desk. Explain the general NEC applications that apply to all, then add special and hazardous occupancies and finally special equipment or conditions as the work progresses. Add early in career, additional electrical standards to master, NFPA 70B (Electrical Equipment Maintenance) and 70E (Electrical Safety in the Workplace).
- Study related Industry Organizations (*ANSI, ASHRAE, ASTM, EPA, NFPA, IEEE, IEC, NEMA, NECA, OSHA, UL*) introduce the background guide within the standard of care for the professions. Explain the full range of codes & standards relevance and application. Think of codes as mandatory and standards as best practice.
- Become familiar with all applicable Codes & Standards as amended by state, local building & energy codes. Use AI as a tool within the MEP's electrical design to enhance specification conformity, code & safety compliance, QA/QC checks and meeting standards intent.
- Build a project's Electrical Specifications and show how to revise & interpret them; to help Specification audience, use standard mark-up methods ... like ~~Strikethrough~~ denotes a deletion, **Bold** denotes an addition, use a **different color/font** with your initials for questions or comments on preliminary marginal notes.
- Provide Safety training within Engineering and within Construction. Become OSHA 30 qualified. Attend & become familiar with daily jobsite or factory safety huddles.
- Teach them about how switchboards, wire/cable, protective devices, VFD, lights, controls and generators are manufactured, certified and tested.
- Encourage participation in electrical blogs, magazine subscriptions and forums.

3. Foundational Project Design Expectations

- Walk them through actual project drawings: site plans, lighting plans & photometrics, power layouts & schedules, single line diagrams, panel schedules, fire alarm & low voltage systems. Develop training to address drafting standards, drawing details, review & coordinate checklists with other design team's drawings and overlay coordination requirements.
- Assign progressive tasks strategically; aligned with growing skills in an incremental skill-building manner, i.e. sketching a One-line diagram, or circuiting a partial floor plan or updating panel schedules, or performing project submittal reviews...eventually introducing most types of drawing elements & project deliverables. Increase these expectations & tasks to perform & master the overall power, lighting and

low voltage system aspects. Become a “go to” expert within your roles and responsibilities; the more you do the more you can take on. Note: Some engineers will show more aptitude and skills at going deeper into a particular task and some others will excel at a broader range of duties.

- Guide them in creating General Sheet Notes, Flag Notes and specific highlight of “arrow” highlight notes. Teach the importance of simple communication instructions shown on plans. Plan Notes should be concise and directive, not overly wordy.
- Train them in industry terms & practices; GO/NO GO, SWOT risk abatement, the Spearin Doctrine, indemnification and general liability.
- Study the various HVAC & Plumbing systems, equipment and controls. Understand the mechanical intent, space requirements & collaborate with who provides which supportive tasks.
- Gradually move to assigning or increasing technical responsibilities using software for load calculations (excel), power quality measurement, voltage drop calculations, short-circuit studies, coordination studies, performing Arc Flash studies (SKM, ETAP) ...etc.
- Incrementally increase the Project Management & Construction Management roles & responsibilities including the initiating contracts, budgeting, team supervision, project deliverables, project sequencing, construction management and Client meetings. Attend pre-bid meetings and pre-construction meetings for depth.

4. Develop CAD/BIM Design Skills

- Mentor them on using drafting tools Revit, AutoCAD MEP, MS Excel.
- Teach & train with the best practices in CAD/BIM model organization, family creation, extract data, coordination with other trades, and how to interpret clash detection reports. These are the design tools engineers need to master. AI can be integrated into BIM coordination, clash detection, or automated compliance checks.
- Get them started right away, using design drafting/modeling checklists, QA/QC to drafting standards & project goals, and learn to print & package drawings, specifications and required calculations into a complete set of Construction Documents to distribute. QA ensures scope and performance benchmarks are met; QC ensures methods and deliverables meet technical standards; KPI ensures progressive project status pathway.

5. Regular Check-in & Feedback

- Best Practice: Set up weekly conversational 1-on-1's for questions, reviews, and feedback. What's working? What needs some attention? What did you enjoy most? What contributions were new? What was stressful? Maintain a standard mentoring checklist.
- Encourage questions - no matter how "basic." Shadowing: Initially, have them observe meetings, site visits, and design reviews.
- Help guide engineers to solve problems & answer questions and encourage critical thinking aspects that add value. Evolve from a designer to an engineer and into a consultant. An engineer's duty encompasses compliance, ethics and safety and carries certain legal, safety and technical authority.
- Assign a first month team onboarding mentor & a 12-month senior mentor. Assign a rotating peer review from other in-house disciplines, learn from each other. These interdisciplinary relationships create a strong company culture.

6. Rigorous Coordination

- Encourage participation in coordination meetings with mechanical, plumbing, general contractor, architect, and subcontractor teams.
- Show them how to create/read/use a RACI matrix (project management tool that defines and clarifies roles, responsibilities and schedule) within the project team.
- Teach them how to spot conflicts, missing requirements, communicate design intent, identify delays, and make design decisions in real-time. Encourage plan adaptability when plans need to change.
- Let them experience in-house, contractor-led and client-led design reviews. Involve other stakeholders during reviews such as utilities, owners and AHJ as the project matures.
- Remember, electrical engineers are involved in every system and every discipline; they are at the center of discussions, integration, coordination and RFI's.

7. Encourage Site Visits

- Let them see how their designs are materially supplied, installed & field tested. Develop close working relationships with the Electrical Contractor to understand what's involved to interpret your plans and provide constructability. Suppliers also have a large role; the vendor usually provides the required technical field installation & testing services.

- Discuss common site issues & field progress and how designs are adapted to weather or site conditions or other non-typical conditions as they arise.
- Meet with site Superintendents, Contractors and AHJ. Learn from them.

8. Soft Skills & Communication

- Teach them how to write clear & brief RFIs, emails, and field reports. Introduce technical writing concepts as applicable to MEP communication. Communication is critical for the AE built world.
- Teach that how you dress, communicate, and carry yourself should always be business-appropriate.
- Coach them on how to communicate with clients, architects, and other engineers vs. how to communicate project needs, goals and progress.
- Listen actively; maintain eye contact, avoid distractions, and ask clarifying questions.
- Run Team meetings. Create an agenda. Close meeting with decisions made, tasks assigned, and progress made. After a few years, develop a keen instinct to avoid unnecessary meetings with a phone call or email instead.

9. Give Autonomy & Earn Respect

- Assign engineers an entire section of a project, to develop & lead, perhaps, initially under supervision. Forcing informed decisions, a sense of discipline ownership, and development of project agility/adaptability encourages increasing project responsibilities and career growth.
- Have them present their work during team reviews or client meetings. Placing engineers in front of teams and clients throughout a project's evolution is an important connection.
- Help develop them into effective Team Leads, Project Managers and Department Managers. It's all about people, purpose and process growing together
- Discuss & encourage engineer's 5-year plans to progress from EIT to P.E. licensure. Explain what EOR, SME and Principal Engineer mean. Introduce construction law; implied warranty via the Spearin Doctrine. Reinforce the NSPE Code of Ethics as a guiding reference for engineer's duty ethos; public safety, honesty, and integrity must guide all engineering decisions.

- Document your annual engineering experiences under a P.E. and demonstrate continuous growth in roles & responsibilities. Celebrate each milestone.

10. Share Mistakes & Lessons Learned

- Share your own experiences; what went wrong and what was learned and how it wasn't repeated. Illustrate how past challenges were overcome. A no-blame culture can report without fear. Tell YOUR story!
- Help them develop a mindset of planning, design, continuous improvement, team delegation, professional growth and career enhancement.
- Productive engineers are bound to make a few mistakes; it comes with the territory. Taking initiative, making judgment calls, working with incomplete information, navigating complex interdependencies, and experimenting with new tools or software all involve risk. Mistakes are a natural part of the evolution and growth process. The key is to learn from them and keep moving forward.
- Here are some productivity tips: start your day with a focused 15-minute priority planning, stay mindful of trade-offs and how they impact the big picture, and perhaps most importantly; to stay flexible and adaptable ... as plans tend to evolve!
- Encourage memberships in local MEP networks. LinkedIn profile is a must. Establish a 1-sheet profile on company's published website. Participate in round-table discussions, national trade/vendor shows. Take relevant and current technical classes. Sign-up for Lunch-N-Learns & Webinars. Develop strong industry knowledgebase & networks.

Closing Thoughts:

The success of mentoring electrical engineers is not measured solely by the engineer's achievements & progress, but also by the mentor's ability to humbly teach, share, and communicate experiences in a way that equips & inspires the next generation for success. Our industry depends on these emerging engineers to fully develop into tomorrow's leaders; being capable, confident, and technically excellent.

We hope this mentoring guide has offered meaningful career insights into building engineering competence, confidence, and professional presence. Best wishes in fostering the next generation of engineering excellence.

About the Author:

Dennis Zimmer is a professional electrical engineer with more than 35 years of experience in MEP, AE, and Controls across commercial, manufacturing, and industrial projects. Dennis has served as a principal engineer, middle manager, and business owner. Over the course of his career, Dennis has held P.E. licenses in 15 states.

He has also been accredited by WA L&I to perform electrical field evaluations for over 7 years and has additional Machine Safety & Risk Assessment certification.

His passion is mentoring engineers in technical mastery, business acumen, and leadership excellence.

Thank you, Dennis

